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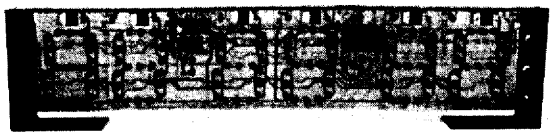
105507 (JE725KIT) 2½" HIGH 6-DIGIT DISPLAY CLOCK KIT



Shown with semi-open enclosure

DESCRIPTION:

The JE725KIT Digital Clock's 2½" high displays are comprised of 126 light emitting diodes that form the display digits for hours, minutes and seconds. The digital clock operates from a monolithic P-channel enhancement mode MOS integrated circuit.

FEATURES:

- Bright 2½"-high 6-digit displays (red)
- 12 hr or 24 hr display format select switch
- Low input voltage 12VAC
- Fast and slow set switches
- Hold count control switch
- Can be viewed from over 50 feet

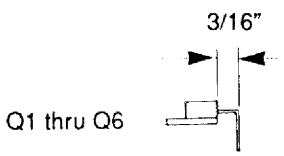
PARTS LIST FOR JE725KIT

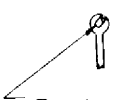
Component Reference	Part Number	Product Description	Quantity
C1,C2,C11	15229	Capacitor, Disc .01µF, 50V	3
C3,C4	93631	Capacitor, Elec. Axial, 1000µF, 16V	2
C5-C10	15245	Capacitor, Disc .022µF, 50V	6
CR1-CR4	35975	Diode, 1Amp, 1N4001	4
DS1-DS6 LED1-LED4	34796	Light Emitting Diode (Red) XC556R, T1¾	130
P1	101178	Plug, Male, 2.1mm	1
Q1-Q6	33048	Transistor, NPN Power, TIP31	6
Q7-Q13	28628	Transistor, NPN, PN2222	7
R1-R7	84929	Resistor, 33 Ohms, 1W, 10% (ORN-ORN-BLK)	7
R8,R9	29989	Resistor, 100K Ohms, 1/4W, 5% (BRN-BLK-YEL)	2
R10-R17	60151	Resistor, 680 Ohms, 1/4W, 5% (BLU-GRY-BRN)	8
S1-S3	26622	Switch, Push Button, N.O., MS102	3
S4	106075	Switch, Slide, ON-ON, SPDT	1
T1	10081	Transformer, Wall, 12VAC/1 Amp	1
U1	26083	IC, Clock Chip, MM5314	1
U2	13055	IC, Driver, CD4049	1
	39335	Socket, IC, 24 Pin, 24LP	1
	37372	Socket, IC, 16 Pin, 16LP	1
	109022	PC Board, Clock, JE725-1	1
	109014	Manual, JE725M	1

ASSEMBLY PREPARATION AND PROCEDURES:

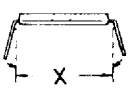
1. Important: Identify all parts on parts list before proceeding.
2. Suggestion: Simulate board assembly by placing the components in their actual place on the picture assembly, then transfer components to the actual board during assembly.
3. Tools Required:
   - Small soldering iron, 27W to 35W.
   - Rosin core solder, .03" Dia. SN60 or SN63. Do not use acid core type or 50/50 solder.
   - Small sponge (water dampened) for cleaning solder tip.
   - Large flat sponge (dry). Approximately 3" × 4" × ¼" thick for holding lens.
   - Small wire cutter/stripper.
   - Small long nose pliers.
   - Screwdriver.
   - DC meter 0 to 18VDC range voltmeter.

COMPONENT LEAD BENDING





Bend component leads on pads to contain part on board before soldering



U1 x = .60"
U2 x = .30"

Straighten leads on flat surface, as shown

SOLDERING TIPS:

1. Feed the solder to the space between the iron tip, the solder pad and next to the component lead.
2. Leaving the iron tip on a pad too long will cause the pad to lift, and will damage the component. Allow approximately 2 seconds per solder joint.
3. Using too much solder can cause the solder to bridge across traces and pads.
4. Keep iron tip clean by frequently wiping the tip across the damp sponge.

JE725KIT ASSEMBLY INSTRUCTIONS: Read and understand all the instructions before starting. No component should sit up over ½" high from the board except for switches S1, S2 and S3.

1. **PC Board Assembly.** See Assembly picture for guidance.

1.1 Insert resistors R1 thru R17. All resistors should be raised approximately ⅛" from the board for cooling purposes. Be sure that the color coded values are correct for each placement. No need to observe polarity. Solder and clip leads.

1.2 Insert diodes CR1 thru CR4 as shown. The polarity band on each of the diodes must be placed as shown on the assembly. Mount all diodes ⅛" above board. Solder and clip leads.

1.3 Insert IC sockets for U1 and U2. Note pin 1 identification notch on the left side of each socket. To keep the sockets flush on the board, bend the first and last pin of each socket. Solder all leads. Do not install U1 and U2 yet.

1.4 Insert Disc capacitors C1, C2, C5 thru C11 (9 total). Note that C1, C2 and C11 are .01 µF. C5 thru C10 are .022 µF. Solder and clip leads.

1.5 Insert transistors Q1 thru Q6. Space components ⅛" above board. Solder and clip leads.

1.6 Insert transistors Q7 thru Q13. Note flat side of transistor is on left. Transistors will sit approx. ½" above board. Solder and clip leads.

1.7 Insert display LEDs. Follow instructions carefully. Insert all LEDs (21 ea.) for each single digit one at a time. Start with the 1st digit (H10) on the left. Be sure the longer of the two leads from each LED goes into the round (top) pad and the shorter lead goes into the square (bottom) pad. Do not bend leads. The flat part of the LED should face downward. Place the 4" x 3" ***flat*** sponge over the "8" digit. Invert. Keep the board level at all times by placing a spacer at the other end of the board. Press the board against the sponge and at the same time provide an oscillating motion until all the leads are standing perpendicular and the LED bodies are flush against the board. Solder **one** lead on each of the 21 LEDs. Turn board over and inspect each LED for flush and perpendicular mounting. Adjust by heating the soldered lead and pushing the LED into the proper position. Next clip all leads **before** soldering the remaining unsoldered leads. Repeat above procedure for the remaining five digits.

1.8 Insert LEDs for LED1 thru LED4. Use same procedure as above.

1.9 Insert capacitors C3 thru C4 flush to board. Note polarity of leads for correct placement. Solder and clip leads.

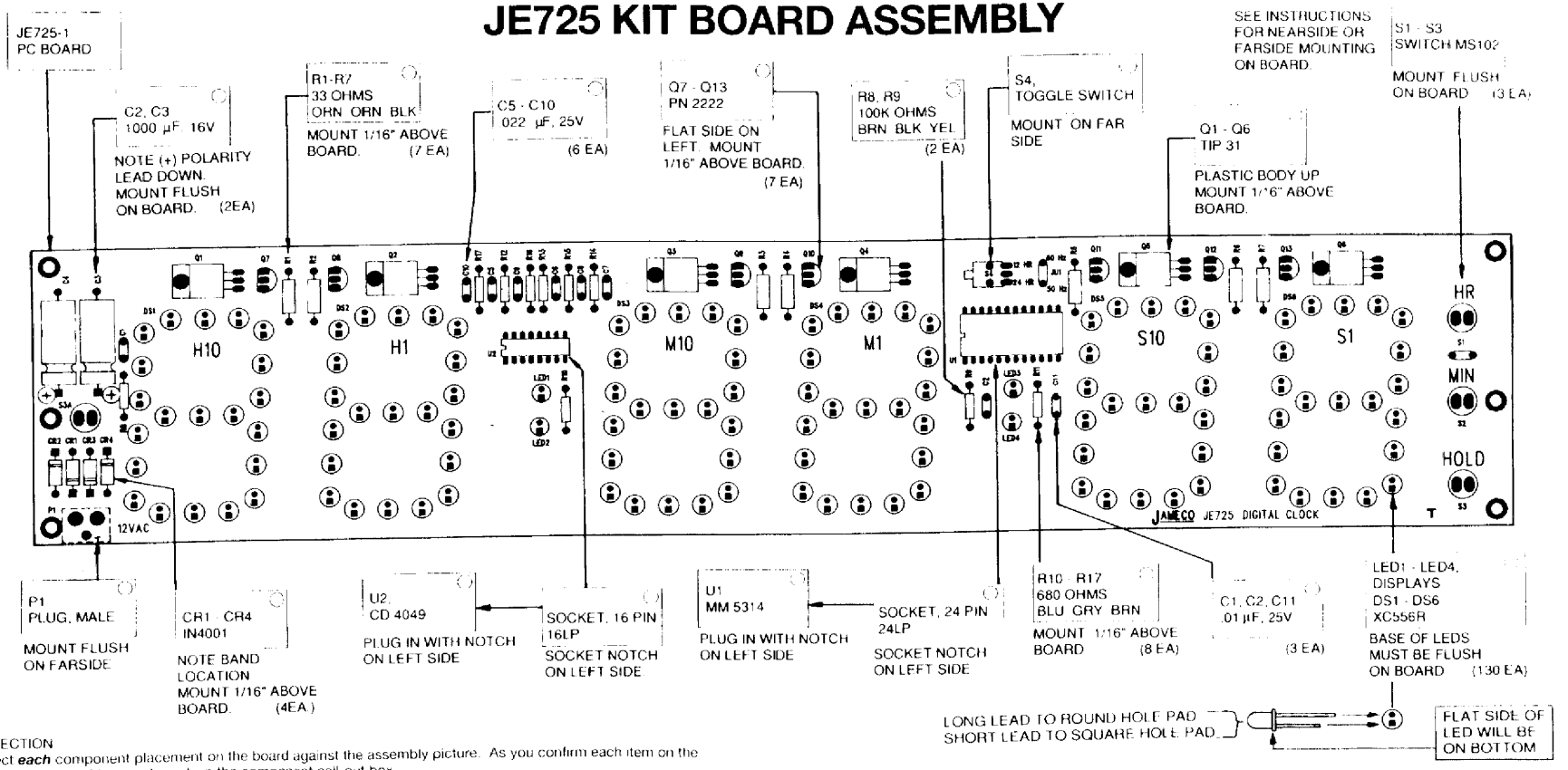
1.10 Insert ICs U1 and U2. Note that notch position on each IC is on the left side.

1.11 Insert switch S4 on the ***far side*** of board. Solder the five terminals on the near side of the board.

1.12 Insert plug P1 on the ***far side*** of board. Solder the three terminals on the near side of the board.

1.13 Install switches S1, S2 and S3. Insert until terminals are flush (bottom) against the board. If you have elected to mount the JE725KIT into the JE725COB (109233) Semi-Open Clock Enclosure, mount these switches from the near side of the board. If you have selected to mount the JE725KIT into the JE725CEA (109241) Extruded Enclosed Aluminum Case, mount these switches from the far side of the board. Solder terminals. Heat quickly and let the solder flow down into the pad on the board. Do not overheat as it may damage the plastic body on the switch.

JE725 KIT BOARD ASSEMBLY



ASSEMBLY INSPECTION

1. Carefully inspect ***each*** component placement on the board against the assembly picture. As you confirm each item on the assembly drawing, place a ✓ into each circle in the component call-out box.
2. Check each solder joint for proper soldering (and forgotten solder leads) on every lead. Check for any solder bridges across pads and traces. Inspect carefully.

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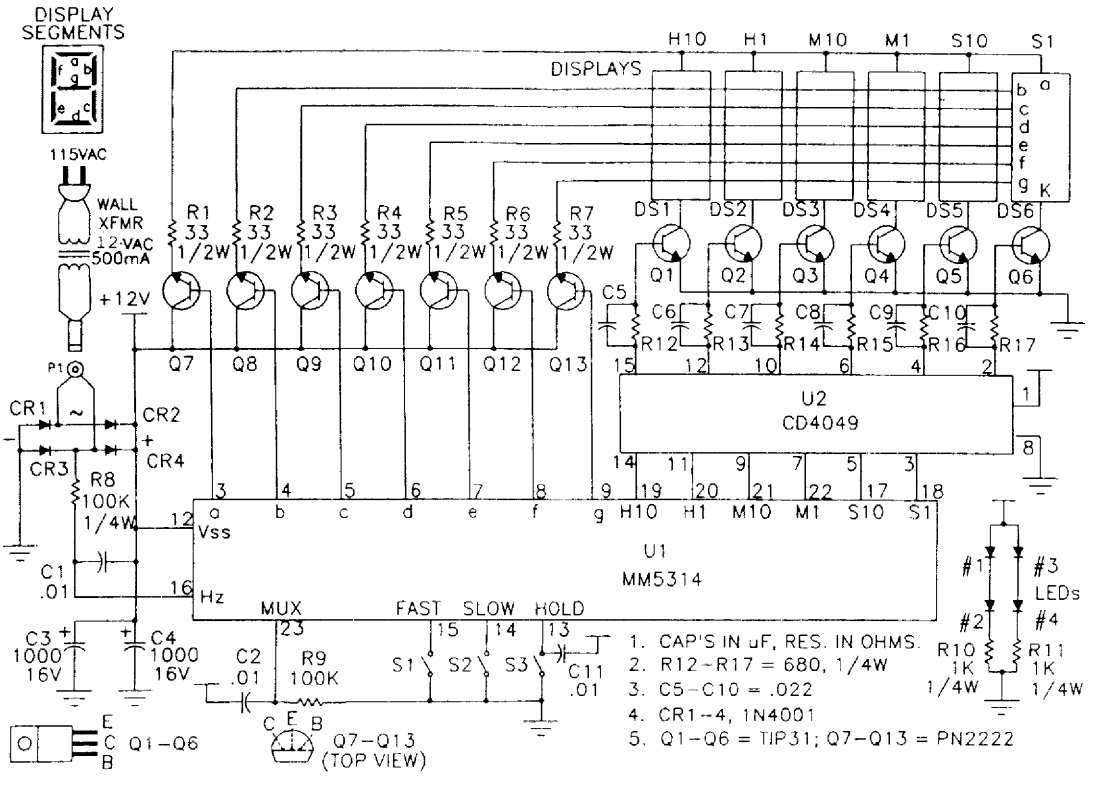
CLOCK OPERATION:

1. Select 12 Hr. or 24 Hr. display format with switch S4 (up for 12 Hrs. down for 24 Hrs.)
2. Insert Connector from wall transformer (T1) into plug (P1) on PC board. Plug transformer into wall.
3. To change minutes and hours, activate top switch (S1).
   To change seconds and minutes activate center switch (S2).
   To stop or hold a pre-set time, push and hold bottom switch (S3). Release at desired setting.

SCHEMATIC DIAGRAM



TROUBLESHOOTING TIPS:

1. **No display at all:** 1.1 Check prongs at wall transformer for proper contact in wall receptacle. Take care to avoid shocks. 1.2 Check for 12VAC on terminals at plug P1. 1.3 Check for reverse insertion of U1 and U2.
2. **DC voltage check:** 2.1 Check for approximately 15VDC across leads of C3 or C4. Also check for improper inser tion. With reversed insertion, clock will only operate for a short period before capacitors are damaged. 2.2 Check diodes CR1 thru CR4 (4 ea.) for proper location of band direction. Remove and reverse if necessary.
3. **Display problems:** 3.1 *Same segment of each digit display is missing:* Check for unsoldered pins of U1 socket pins 3 thru 9. Also check resistors R1 thru R7, Q7 thru Q13 for unsoldered leads. 3.2 *Total display(s) not lit:* Check for unsoldered leads on Q1 thru Q6, U1 pins 17 thru 22, U2 pins 2,4,6,10,12 and 15. Check for reversed insertion of Q1 thru Q6. 3.3 *Certain LED(s) not lit:* Improper insertion – unsolder and reverse.
4. **General and intermittent problems:** 4.1 Solder bridges across pins of U1 or U2. 4.2 Unsoldered pads or cold solder joints on leads. 4.3 Improper component insertion.

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